REMARKS

Applicants respectfully request the Examiner to reconsider the present application in view of the foregoing amendments to the claims and the following remarks.

Status of the Claims

The Office Action is non-final. Claims 1-48 are currently pending in the present application. Claims 8, 9, 13-30 and 32-48 have been withdrawn from further consideration as being drawn to a non-elected invention. Claims 1 and 2 have been amended to further define and clarify the present invention, and claim 31 has been amended to avoid its dependency on withdrawn claims.

Support for the amendments to claim 1 can be found on page 5, lines 20 and 26-27 of the specification.

Based upon the above considerations, entry of the present Amendment is respectfully requested.

Issues Under the Obviousness-Type Double Patenting Doctrine

The following provisional rejections under the judicially created doctrine of obviousness-type double patenting were presented by the Examiner.

Claims 1-7, 10-12 and 31 stand provisionally rejected as being unpatentable over claims 1-4 of co-pending Application No. 11/943,207.

Claims 1-7, 10-12 and 31 stand provisionally rejected as being unpatentable over claims 45-70 of co-pending Application No. 12/225,069.

Claims 1-7, 10-12 and 31 stand provisionally rejected as being unpatentable over claims 1-56 of co-pending Application No. 11/727,729.

Applicants respectfully request that the Examiner hold the above rejections in abeyance, pending an indication that the claims in the present application are otherwise in a condition for allowance.

Issues Under 35 U.S.C. § 102(b), Anticipation

The following rejections under 35 U.S.C. § 102(b) were presented by the Examiner.

Claims 1-4, 7, 10, 11 and 12 stand rejected under 35 U.S.C. § 102(b) as anticipated by Abe *et al.*, "*Long-Period Ordered Structure in a High-Strength Nanocrystalline Mg-1 at% Zn-2 at% Y Alloy Studied by Atomic-Resolution Z-Contrast STEM*," Acta Materialia, Vol. 50, pp. 3845-3857, (2002) (hereinafter "Abe").

Claims 1-4, 7, 10, 11 and 12 stand rejected under 35 U.S.C. § 102(b) as anticipated by Kim *et al.*, U.S. Patent No. 6,471,797 (hereinafter "Kim").

Applicants respectfully traverse these rejections.

As indicated in MPEP 2113, Product-by-Process Claims, once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi,* 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983) (MPEP 2113).

Applicants herein provide the following differences between the claimed invention and Abe and Kim.

The magnesium alloy casting product of amended claim 1 has a long period stacking ordered structure phase.

In contrast, Abe teaches that rapidly solidified magnesium alloy has a long period stacking ordered structure phase. Abe does not teach that the magnesium alloy casting product has a long period stacking ordered structure phase.

The "casting product" feature of the presently amended claim 1 defines a product, not a process, for the following reasons.

The crystal structure of the rapidly solidified magnesium alloy has a submicron crystal grain size, and does not have a crystal grain that is greatly larger in size as compared with the submicron size crystal grain. Against this, the crystal structure of the magnesium alloy casting product has a greatly larger crystal grain size as compared with the submicron size crystal (*e.g.*, a crystal grain size of 2 μm or more). Therefore, the magnesium alloy casting product and the rapidly solidified magnesium alloy can be easily distinguished from each other, as well known to those skilled in the art.

With regard to claim 3, Applicants submit that the feature of this claim, "a plastically worked product which is produced by preparing a magnesium alloy casting product," also defines a product, not a process, for the following reasons.

The crystal structure of the rapidly solidified magnesium alloy has a submicron crystal grain size, and does not have a large crystal grain size as compared with the submicron size crystal.

Against this, the crystal structure of the plastically worked product has a crystal grain size that is greatly larger as compared with the submicron size crystal. Therefore, the plastically worked product and the rapidly solidified magnesium alloy can be easily distinguished from each other. Again, Applicants submit that for those skilled in the art, this is common knowledge.

Regarding the rejection based on the Kim reference, Applicants respectfully contend that the Examiner's assertions are incorrect for the following reasons.

The alloy composition $Mg_{95}Zn_{4.3}Y_{0.7}$ (*See*, Kim, column 4, Table 1, alloy #10) does not have a long period stacking ordered structure phase because this alloy is outside the composition ranges of currently amended claim 1.

Additionally, Kim teaches that Mg-Zn-Y alloys have a quasicrystalline phase. However, the Kim reference does not teach that Mg-Zn-Y alloys have a long period stacking ordered structure phase.

Applicants point out that the long period stacking ordered structure phase is different from the quasicrystalline phase based on the following reasons.

The shape of the quasicrystalline phase is of a regular icosahedron. The quasicrystalline phase has not adjusted to a hexagonal close-packed (hcp) structured magnesium phase, and is different than the hcp structure in that it has high hardness mechanical properties and is very brittle.

Against this, the long period stacking ordered structure phase has adjusted to the hcp structured magnesium phase and has high strength and high toughness mechanical properties. Therefore, the long period stacking ordered structure phase is quite different from the quasicrystalline phase.

For clarity purposes, Applicants herein provide a summary of differences between the long period stacking ordered structure phase and the quasicrystalline phase below.

	Crystal Structure:	Mechanical Properties:
quasicrystalline phase	regular icosahendron - having not adjusted to hcp structure	high hardness and very brittle
long period stacking ordered structure phase	having adjusted to hcp structure	high strength and high toughness

Therefore, Applicants respectfully submit that based on the above, there are differences between the claimed product and the prior art products of the Abe and Kim references which render the claimed product unobvious from these references. Since both the Abe and Kim references are silent regarding the features of the presently claimed invention, they do not teach the present invention.

Because "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," each of the cited references cannot be a basis for a rejection under § 102(b). *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See MPEP 2131 – To Anticipate a Claim, the Reference Must Teach Every Element of the Claim.

Applicants respectfully request reconsideration and withdrawal of the present rejections.

Claim Objections

Claims 11 and 12 are objected to due to informalities. The Examiner asserts that the unit for work strain in claims 11 and 12 is unclear. Applicants respectfully traverse.

Applicants note that there is no unit of measure for total strain within the claims 11 and 12. If, for example, a sample that is 100 mm in total length is prepared and then is expanded by 10 mm by pulling the sample, an amount of strain x is calculated by x = 10/100=0.1, without any units.

Claim 31 is objected to due to being in improper dependent form. The Examiner asserts that claim 31 fails to further limit the subject matter of a previous claim. Applicants have amended claim 31 to remove dependencies from previously withdrawn claims. Applicants submit that the presently amended claim 31 properly depends from and limits the claims from which it depends.

Applicants respectfully request reconsideration and withdrawal of the present objections.

Issues Under 35 U.S.C. § 103(a), Obviousness

The following 35 U.S.C. § 103(a) rejections were presented by the Examiner.

Claims 5 and 6 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Abe or Kim, and further in view of JP 05-306424 (hereinafter "JP-424").

Claim 31 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Abe or Kim, and further in view of Fisher, U.S. Patent No. 3,334,998 (hereinafter "Fisher")

Applicants respectfully traverse these rejections.

Graham v. John Deere, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), has provided the controlling framework for an obviousness analysis. A proper analysis under 35 U.S.C. § 103(a) requires consideration of the four *Graham* factors of: determining the scope and content of the prior art; ascertaining the differences between the prior art and the claims that are at issue; resolving the

level of ordinary skill in the pertinent art; and evaluating any evidence of secondary considerations (*e.g.*, commercial success; unexpected results). 383 U.S. at 17, 148 USPQ at 467.

M.P.E.P. § 2143 sets forth the guidelines in determining obviousness. But before the Examiner can utilize these guidelines, the Examiner has to take into account the factual inquiries set forth in *Graham v. John Deere*; *supra*. To reject a claim based on the above mentioned guidelines, the Examiner must resolve the *Graham* factual inquiries. MPEP §2143. If the Examiner resolves the *Graham* factual inquiries, then the Examiner has to provide some rationale for determining obviousness, wherein M.P.E.P. § 2143 sets forth the rationales that were established in *KSR Int'l Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). Applicants respectfully submit that the Examiner has not appropriately resolved the *Graham* factors, including the factors of determining the scope and content of the prior art and ascertaining the differences between the prior art and the claims that are at issue. Based on the following, Applicants maintain that the above-mentioned *Graham* factors actually work in Applicants' favor, and submit that since the Examiner did not resolve the *Graham* factors, the rationale the Examiner provides for combining the cited references is improper.

Applicants respectfully submit that the presently claimed invention is unobvious over the cited references in the presented rejections, for the following reasons.

Applicants incorporate the above comments concerning the Abe and Kim references and respectfully submit that the presently claimed invention is unobvious over the cited references in the presented rejections. That is, the JP-424 and Fisher references are applied only for features presented in dependent claims. JP-424 and Fisher do not cure the deficiencies of Abe or Kim as discussed above. Therefore, even if the secondary references were combined with the primary references in

the manner suggested by the Examiner, the result of such combination would still not suggest the features of the dependent claims.

In view of the above, it is submitted that the present invention as claimed is distinguished over the references cited in the presented rejections.

In light of the above presently amended claims and remarks, because there is no disclosure, teaching, suggestion, reason or rationale provided in the references that would lead one of ordinary skill in the art to arrive at the instant invention as claimed, it follows that the references are incapable of rendering the instant invention obvious under the provisions of 35 USC § 103(a). Based upon the above, and applying the *Graham factors* analysis test, it is submitted that a *prima facie* case of obviousness has not been established.

Applicants respectfully request reconsideration and withdrawal of the above rejections.

CONCLUSION

Applicants respectfully submit that all of the objections and rejections raised by the Examiner have been overcome, and that the present application now stands in condition for allowance.

Should there be any outstanding matters that need to be resolved, the Examiner is respectfully requested to contact Paul D. Pyla at the telephone number below, in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized to charge payment or credit any overpayment to Deposit Account No. 23-0975 for any additional fees required under 37.C.F.R. §§1.16 or 1.17.

The Commissioner is authorized to charge any deficiency or to credit any overpayment associated with this communication to Deposit Account No. 23-0975, with the EXCEPTION of deficiencies in fees for multiple dependent claims in new applications.

Respectfully submitted,

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